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NAS CECIL FIELD
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RECORD OF DECISION SITE 7 OPERABLE UNIT 3 (OU3) NAS CECIL FIELD FL
3/1/1998
ABB ENVIRONMENTAL

**RECORD OF DECISION
SITE 7, OPERABLE UNIT 3**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Unit Identification Code: N60200

Contract No.: N62467-89-D-0317/090

Prepared by:

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Prepared for:

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March 1998



CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/090 are complete and accurate and comply with all requirements of this contract.

DATE: March 30, 1998

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(DFAR 252.227-7036)

TABLE OF CONTENTS

Record of Decision
Site 7, Operable Unit 3
Naval Air Station Cecil Field
Jacksonville, Florida

| Chapter | Title | Page No. |
|---------|---|----------|
| 1.0 | DECLARATION FOR THE RECORD OF DECISION | 1-1 |
| 1.1 | SITE NAME AND LOCATION | 1-1 |
| 1.2 | STATEMENT OF BASIS AND PURPOSE | 1-1 |
| 1.3 | ASSESSMENT OF THE SITE | 1-1 |
| 1.4 | DESCRIPTION OF THE SELECTED REMEDY | 1-1 |
| 1.5 | STATUTORY DETERMINATIONS | 1-2 |
| 1.6 | SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF THE REMEDY | 1-2 |
| 2.0 | DECISION SUMMARY | 2-1 |
| 2.1 | SITE NAME, LOCATION, AND DESCRIPTION | 2-1 |
| 2.2 | SITE HISTORY AND ENFORCEMENT ACTIVITIES | 2-5 |
| 2.3 | HIGHLIGHTS OF COMMUNITY PARTICIPATION | 2-6 |
| 2.4 | SCOPE AND ROLE OF OU | 2-6 |
| 2.5 | SUMMARY OF SITE CHARACTERISTICS | 2-7 |
| 2.6 | SUMMARY OF SITE RISKS | 2-8 |
| 2.7 | DESCRIPTION OF ALTERNATIVES | 2-17 |
| | 2.7.1 Surface Soil Alternatives | 2-17 |
| | 2.7.2 Groundwater Alternatives | 2-20 |
| 2.8 | SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES | 2-20 |
| 2.9 | SELECTED REMEDIES | 2-20 |
| | 2.9.1 Site 7 Surface Soil | 2-20 |
| | 2.9.2 Site 7 Groundwater | 2-21 |
| 2.10 | STATUTORY DETERMINATIONS | 2-21 |
| 2.11 | DOCUMENTATION OF SIGNIFICANT CHANGES | 2-21 |

REFERENCES

LIST OF FIGURES

Record of Decision
Site 7, Operable Unit 3
Naval Air Station Cecil Field
Jacksonville, Florida

| <u>Figure</u> | <u>Title</u> | <u>Page No.</u> |
|---------------|---|-----------------|
| 2-1 | General Location Map | 2-2 |
| 2-2 | Location Map | 2-3 |
| 2-3 | General Features | 2-4 |
| 2-4 | Distribution of Inorganics in Confirmatory Surface Soil Samples | 2-9 |
| 2-5 | Distribution of Total Polynuclear Aromatic Hydrocarbon Concentra- tions in Confirmatory Surface Soil Samples | 2-10 |
| 2-6 | Total Recoverable Petroleum Hydrocarbon Concentrations in Confirma- tory Surface Soil Samples | 2-11 |
| 2-7 | Organics in Confirmatory Subsurface Soil Samples | 2-12 |
| 2-8 | Organic Compound Concentrations in Confirmatory Groundwater Samples | 2-13 |
| 2-9 | Inorganic Concentrations in Confirmatory Groundwater Samples | 2-14 |
| 2-10 | Excess Lifetime Cancer Risk Summary, Current Land Use | 2-15 |
| 2-11 | Excess Lifetime Cancer Risk Summary, Future Land Use | 2-16 |
| 2-12 | Hazard Index Summary, Future Land Use | 2-18 |
| 2-13 | Extent of Surface Soil to Be Removed | 2-19 |

LIST OF TABLES

| <u>Table</u> | <u>Title</u> | <u>Page No.</u> |
|--------------|--|-----------------|
| 2-1 | Explanation of Evaluation Criteria | 2-22 |
| 2-2 | Comparative Analyses of Remedial Alternatives for Site 7 | 2-23 |
| 2-3 | Synopsis of Federal and State Regulatory Requirements | 2-24 |

GLOSSARY

| | |
|-----------------------|---|
| ABB-ES | ABB Environmental Services, Inc. |
| ARAR | applicable or relevant and appropriate requirement |
| bls | below land surface |
| BRA | baseline risk assessment |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| ELCR | excess lifetime cancer risk |
| FDEP | Florida Department of Environmental Protection |
| FS | feasibility study |
| HI | hazard index |
| HHRA | human health risk assessment |
| mg/kg | milligrams per kilogram |
| µg/l | micrograms per liter |
| NAS | Naval Air Station |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| OU | operable unit |
| PAH | polynuclear aromatic hydrocarbon |
| RA | remedial action |
| RAO | remedial action objective |
| RCRA | Resource Conservation and Recovery Act |
| RI | remedial investigation |
| ROD | Record of Decision |
| SOUTHNAV- FACENCOM | Southern Division, Naval Facilities Engineering Command |
| SVOC | semivolatile organic compound |
| TRPH | total recoverable petroleum hydrocarbons |
| USEPA | U.S. Environmental Protection Agency |
| VOC | volatile organic compound |
| yd ³ | cubic yards |

1.0 DECLARATION FOR THE RECORD OF DECISION

1.1 SITE NAME AND LOCATION. Site 7, Former Firefighting Training Area, Operable Unit (OU) 3, is located near the northwest end of the old 310 flightline approximately 800 feet east of Lake Fretwell and 1,200 feet northwest of the east-and-west flightline on the main base of Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. Approximately 2,000 feet east of Site 7 are the aircraft hangars, Buildings 13 and 14.

1.2 STATEMENT OF BASIS AND PURPOSE. This decision document presents the selected remedial action (RA) for Site 7, located at NAS Cecil Field, Jacksonville, Florida, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations 300) (U.S. Environmental Protection Agency [USEPA], 1990). This decision document was prepared in accordance with the USEPA decision document guidance (USEPA, 1992). This decision is based on the Administrative Record for Site 7, OU 3.

The USEPA and the State of Florida concur with the selected remedy.

1.3 ASSESSMENT OF THE SITE. Releases of hazardous substances from this site, if not addressed by implementing the response actions selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment. Human health risks are posed if the groundwater from the surficial aquifer was used as a potable water source. Human health and possibly wildlife may be at risk if exposed to Site 7 surface soil.

1.4 DESCRIPTION OF THE SELECTED REMEDY. This ROD is the final action for Site 7, OU 3. Final RODs have been approved for OUs 1, 2, 4, and 7. Remedial investigations (RIs) and baseline risk assessments (BRAs) have been completed for OUs 5, 6, and 8.

The selected remedy addresses risk reduction in soil and groundwater at Site 7. Remedial alternatives selected for Site 7 include surface soil excavation and groundwater monitoring.

The major components of the selected remedy are listed below. The selected soil alternative includes

- excavating approximately 790 cubic yards (yd³) of surface soil (to a depth approximately 1 foot below land surface [bls]) located in an open field at the end of the old 310 flightline;
- disposing of the excavated surface soil to an eligible landfill, either a Resource Conservation and Recovery Act (RCRA) Subtitle D (solid waste) landfill or an RCRA Subtitle C (hazardous waste) landfill;
- backfilling the excavated area with clean soil; and

- seeding and fertilizing the excavated area to promote vegetative growth.

The selected groundwater alternative includes

- restricting use of the surficial aquifer groundwater at Site 7,
- monitoring the groundwater for a period for 30 years or less if benzene concentrations meet guidance criteria (State of Florida drinking water standards), and
- reviewing the status of the groundwater every 5 years for 30 years.

1.5 STATUTORY DETERMINATIONS. The selected remedy is protective of human health and the environment, and is cost effective. The nature of the selected remedy for Site 7 is such that the single benzene detection in groundwater may remain above regulatory standards during the RA. As a result, applicable or relevant and appropriate requirements (ARARs) will not be met as a near-term goal, but will be met as a long-term goal. The remedy utilizes permanent solutions and satisfies the statutory preference for remedies that reduce toxicity, mobility, or volume as a principal element. Because this remedy would result in hazardous substances remaining onsite above health-based levels, a review will be conducted within 5 years of the commencement of RAs to ensure that the remedy continues to provide adequate protection of human health and the environment.

1.6 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF THE REMEDY.



David Porter, P.E.
Base Realignment and Closure
Environmental Coordinator

31 March 1998
Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION. NAS Cecil Field is located 14 miles southwest of Jacksonville, Florida. The majority of Cecil Field is located within Duval County; the southernmost part of the facility is located in northern Clay County (Figure 2-1).

NAS Cecil Field was established in 1941 and provides facilities, services, and material support for the operation and maintenance of naval weapons, aircraft, and other units of the operation forces as designated by the Chief of Naval Operations. Some of the tasks required to accomplish this mission over past years included operation of fuel storage facilities, performance of aircraft maintenance, maintenance and operation of engine repair facilities and test cells for turbo-jet engines, and support of special weapons systems.

NAS Cecil Field is scheduled for closure in 1999. Much of the facility will be transferred to the Jacksonville Port Authority. The facility will have multiple uses, but will be used primarily for aviation-related activities. The area, which includes Site 7, is scheduled for aviation-related activities.

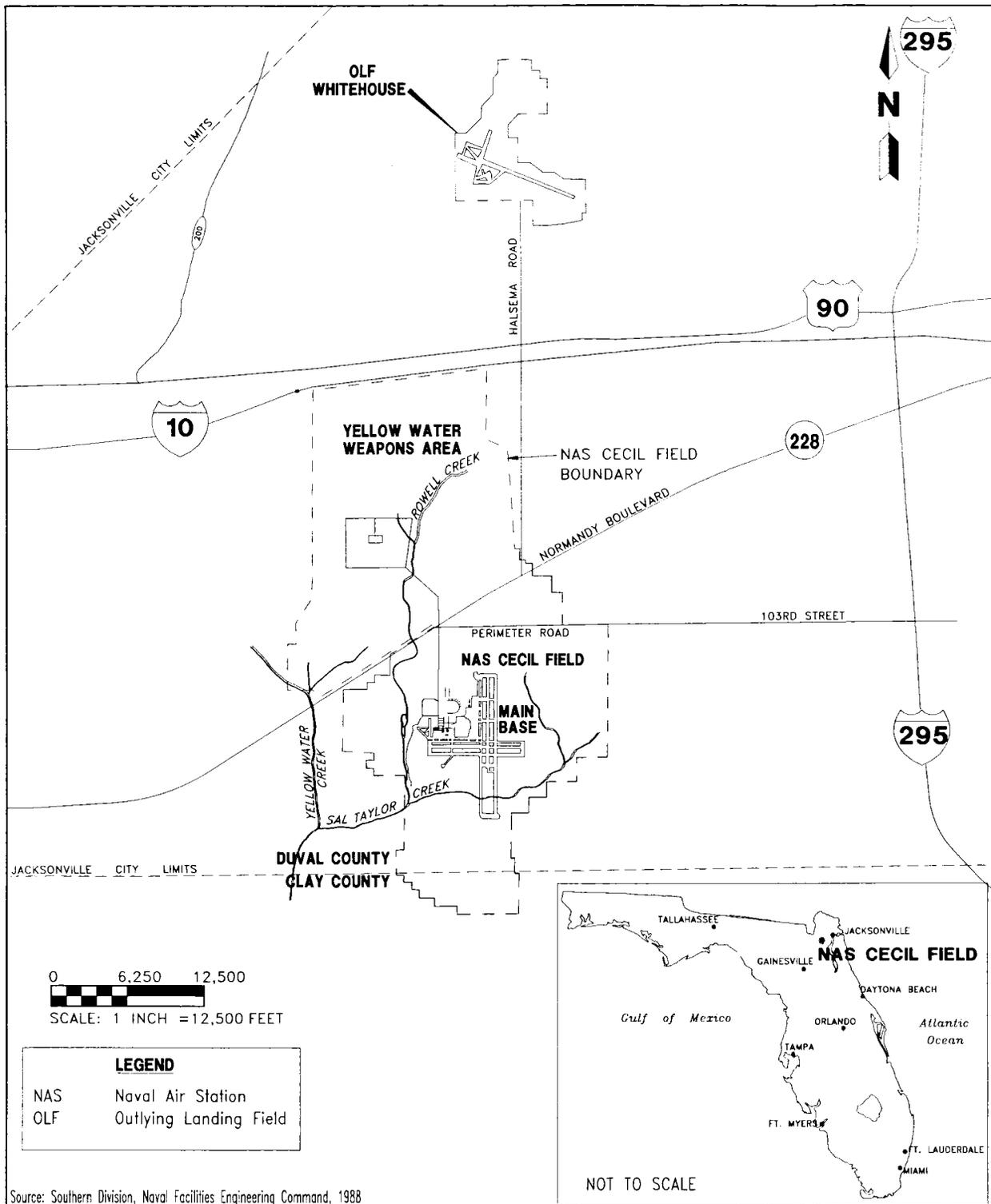
Land surrounding NAS Cecil Field is used primarily for forestry, with some agriculture and ranching use. Small communities and individual dwellings are in the vicinity of NAS Cecil Field. The closest community, located on Nathan Hale Road, abuts the western edge of the facility. The nearest incorporated municipality, Baldwin, is approximately 6 miles northwest of the main facility entrance.

To the east of NAS Cecil Field, the rural surroundings grade into a suburban fringe bordering the major east and west roadways. Low commercial use, such as convenience stores, and low density residential areas characterize the land use (ABB Environmental Services, Inc. [ABB-ES], 1992). A development called Villages of Argyle, when complete, is planned to consist of seven separate villages that will ultimately abut NAS Cecil Field to the south and southeast. A golf course and residential area also border NAS Cecil Field to the east (Southern Division, Naval Facilities Engineering Command [SOUTHNAVFACENGCOM], 1989).

Site 7 is located near the west end of the east-and-west flightline (SOUTHNAVFAC-ENGCOM, 1989). Resultantly, there is no housing in the immediate vicinity of Site 7. The nearest housing, the bachelor officer quarters, is located approximately 2,500 feet north to northeast of the site.

Site 7, Former Firefighting Training Area, is located near the northwest end of the old 310 flightline on the main base (Figure 2-2). The site is located approximately 800 feet east of Lake Fretwell and 1,200 feet northwest of the east-and-west flightline. Approximately 2,000 feet east of the site are the active aircraft hangars, Buildings 13 and 14.

Site 7 is relatively flat, gently sloping to the west and southwest (Figure 2-3). The dominant features at Site 7 are the old flightline and adjoining apron and a storage unit, Building 865. The areas immediately surrounding the old flightline are open, grassy fields. There is no obvious surface drainage at the site. Site 7 is accessible by the current east-and-west flightline apron and by



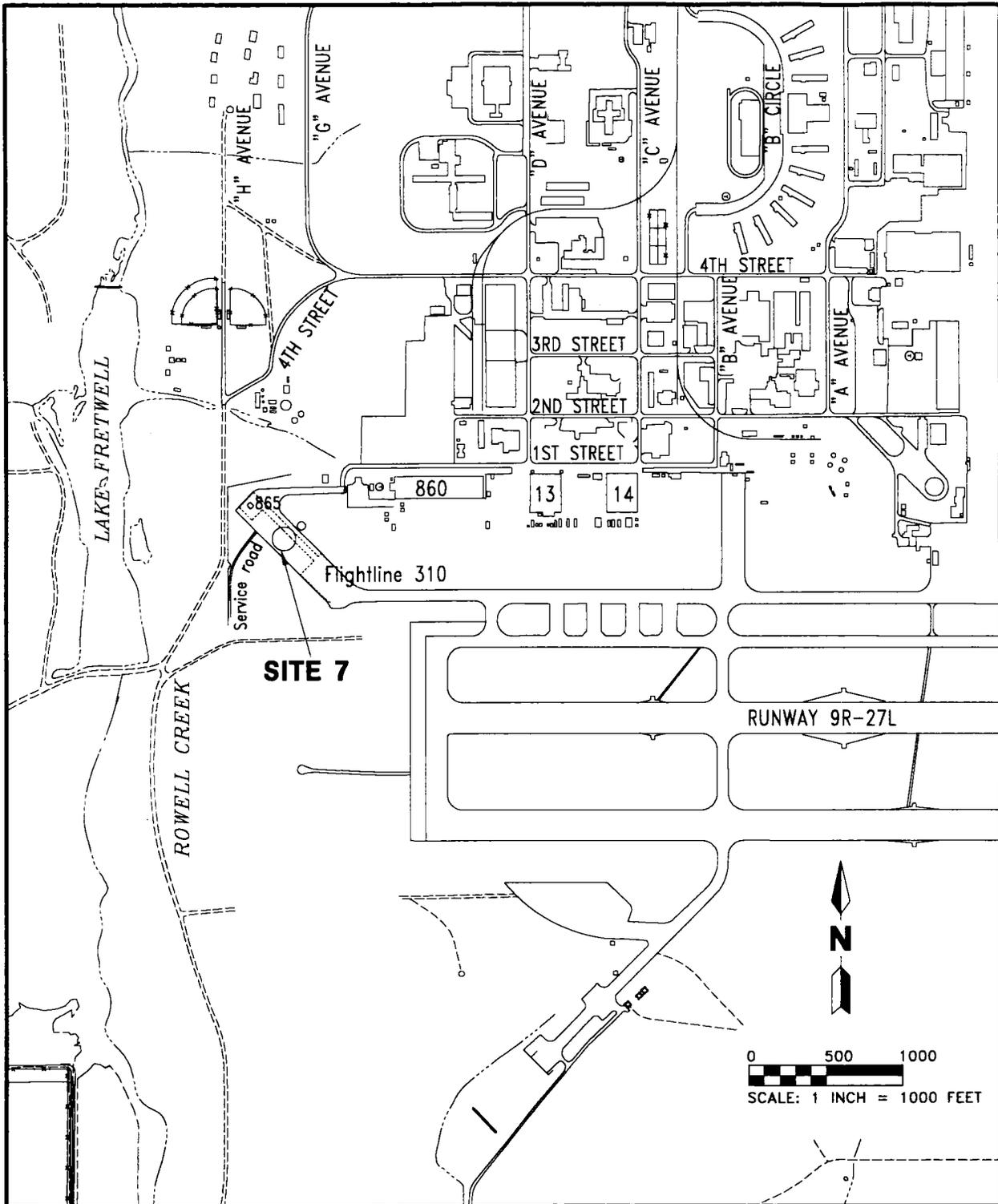
**FIGURE 2-1
GENERAL LOCATION MAP**



**RECORD OF DECISION
SITE 7, OPERABLE UNIT 3**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

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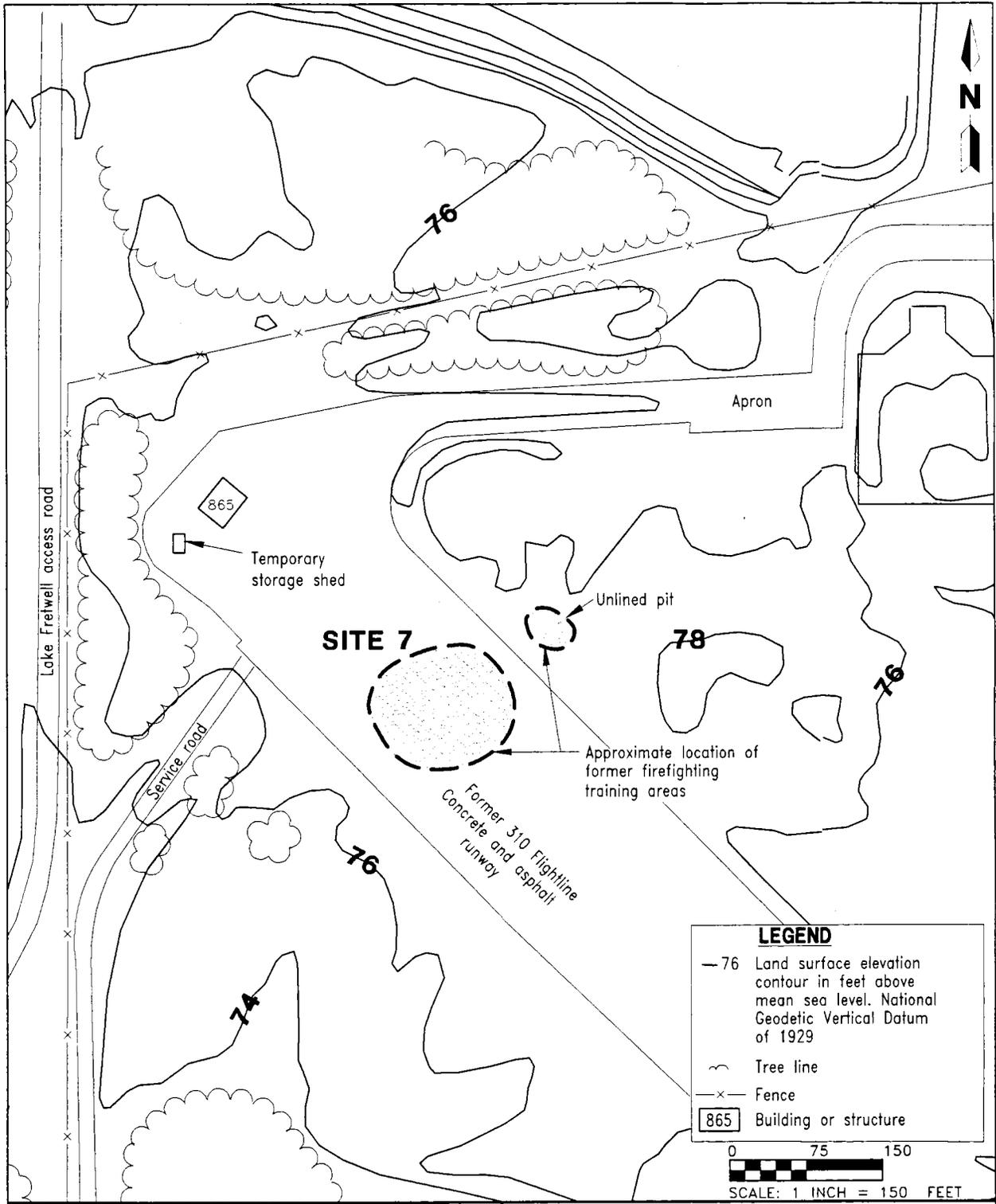
**FIGURE 2-2
LOCATION MAP**



**RECORD OF DECISION
SITE 7, OPERABLE UNIT 3**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

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**FIGURE 2-3
GENERAL FEATURES**



**RECORD OF DECISION
SITE 7, OPERABLE UNIT 3**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

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an unpaved service road. Immediately west of the end of the old flightline is the Lake Fretwell access road, which is separated from the site by a security fence.

Currently, Site 7 is used as an ordnance storage and general storage area. Storage structures are located at the end of the old 310 flightline. Explosive ordnance is stored in Building 865, and unarmed ordnance is stored in portable storage units. Building 865 was erected sometime after firefighting training ceased in 1975 and before 1980, as evidenced by aerial photographs.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES. Site 7 consisted of two firefighting training areas on the old asphalt flightline (both of which are located within the large circle shown on Figure 2-3) and an unlined pit northeast of and adjacent to the old flightline. From the 1950s to 1965, firefighting training activities were conducted on the old flightline. From approximately 1965 until firefighting training ceased in 1975, firefighting training activities were also conducted in the unlined pit. Firefighting training activities included placing aircraft frames on the old flightline and in the pit and dousing the frames with flammable liquids. The aircraft frames were ignited, and firefighting personnel practiced fire containment and extinguishing techniques on the burning frames. Flammable liquids used in the training activities included waste paints and paint thinners, spent chlorinated and nonchlorinated solvents, and petroleum, oil, and lubricant wastes. Extinguishing materials consisted of water and nontoxic proteinaceous materials such as fish, feather, horn, or hoof meal. Extinguishing materials and unburned wastes were left on the site, where they evaporated, infiltrated through the cracks in the asphalt and into the soil, or migrated from the site via surface runoff.

NAS Cecil Field was placed on the National Priority List (NPL) by the USEPA and the Office of Management and Budget in December 1989. a Federal Facility Agreement (FFA) for NAS Cecil Field was signed by the Florida Department of Environmental Protection (FDEP) (formerly the Florida Department of Environmental Regulation), the USEPA, and the Navy in 1990. Following the listing of NAS Cecil Field on the NPL and the signing of the site management plan (SMP), remedial response activities at the facility were conducted under CERCLA authority.

Investigations at Site 7 began in 1985. The previous investigations are listed in chronological order:

- Initial Assessment Study of Naval Air Station Cecil Field, Jacksonville, Florida, Envirodyne Engineers, 1985,
- RCRA Facility Investigation Naval Air Station Cecil Field, Harding Lawson Associates, 1988,
- Remedial Investigation, Operable Unit 3, Sites 7 and 8, Naval Air Station Cecil Field, ABB-ES, 1997c (this document includes the BRA),
- Feasibility Study (FS), Operable Unit 3, Naval Air Station Cecil Field, ABB-ES, 1997a, and

- Draft Proposed Plan for Remedial Action, Operable Unit 3, Site 7, Former Firefighting Training Area, Naval Air Station Cecil Field, ABB-ES, 1997b.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION. The results of the RI and the BRA, the remedial alternatives of the FS, and the preferred alternative given in the Proposed Plan have been presented to the NAS Cecil Field Restoration Advisory Board (composed of community members as well as representatives from the Navy and State and Federal regulatory agencies).

The RI and BRA results and the remedial alternatives of the FS were presented at RAB meetings held on August 19, 1997, and September 16, 1997, respectively. The preferred alternative was presented at the November 18, 1997, RAB meeting. A 30-day public comment period was held from October 28 through November 28, 1997. No comments were received during the comment period.

Public notices of the availability of the Proposed Plan were placed in the *Metro* section of the *Florida Times Union* on November 1, 1997. These local editions target the communities closest to NAS Cecil Field. Documents pertaining to Site 7 are available to the public at the Information Repository, located at the Charles D. Webb Wesonnett Branch of the Jacksonville Library, 6887 103rd Street, Jacksonville, Florida.

2.4 SCOPE AND ROLE OF OU. The environmental concerns at NAS Cecil Field are complex. As a result, work at the various sites has been organized into eight OUs along with more than 100 other areas undergoing evaluation in the Base Realignment and Closure and underground storage tank programs.

Final RODs have been approved for OUs 1, 2, 4, and 7. RIs and BRAs have been completed for OUs 3, 5, 6, and 8.

Investigations at OU 3, Site 7, indicated the presence of surface soil and groundwater contamination. The purpose of this RA is to remediate the soil contamination and monitor and remediate the groundwater contamination that pose human health risks. Inhalation or ingestion of surface soil and ingestion of groundwater extracted from the surficial aquifer pose human health risks that exceed the State of Florida threshold of 1×10^{-6} .

The remedial action objectives (RAOs) listed below were established for Site 7.

- Prevent exposure to contaminants that pose an unacceptable human health risk and are present at concentrations exceeding the Florida soil cleanup goal for industrial sites.
- Prevent exposure to groundwater that contains benzene at concentrations greater than the Florida groundwater cleanup goal.

The RA documented in this ROD will achieve these RAOs.

2.5 SUMMARY OF SITE CHARACTERISTICS.

Geology. Geologic materials recovered during drilling operations at Site 7 indicate that the site is underlain by approximately 85 feet fine- to medium-grained sand with some silty sand, clayey sand, and clay stringers. Beneath these sandy materials is a sandy clay with dolomite pebbles unit. This clayey unit is approximately 5 feet thick, dense, and moist. Underlying this sandy clay unit is a dense dolomite layer.

Hydrogeology. In the area of investigation, there are three water-bearing systems: (1) the surficial aquifer, (2) the intermediate aquifer, and (3) the Floridan aquifer system. Between each system is an aquitard (less permeable unit). Only the surficial aquifer was investigated at Site 7.

The surficial aquifer is unconfined and composed of fine- to medium-grained sand, with minor amounts of silt and clay stringers. These geologic deposits extend to approximately 85 feet bls and are underlain by clay and dolomite. The surficial aquifer is considered to behave as one hydrological unit.

The water table in the surficial aquifer is typically between 5 and 10 feet bls. Groundwater flow is generally to the northwest, toward Lake Fretwell, at an average rate of 19 feet per year. Water elevation data indicate that the vertical flow direction is downward at Site 7 and is predicted (based on U.S. Geological Survey data) to be upward off site in the vicinity of Lake Fretwell.

Contaminant Sources. The primary source of contamination at Site 7 was the liquid wastes, i.e., waste solvents, paints and paint thinners, and fuel, used to ignite aircraft frames. Training activities have ceased and waste materials are not stored at Site 7; therefore, there is no source for continued contamination at the site.

RI Results. RI activities were conducted by ABB-ES during the fall of 1994, the spring of 1995, and the summer of 1997 to characterize the nature and extent of contamination at Site 7. Environmental samples for laboratory analysis were collected from surface soil, subsurface soil, and groundwater. Analytical results indicated the presence of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs), as well as inorganics, in surface soil, subsurface soil, and groundwater. A summary of analytical results for each medium is presented below.

Surface Soil Analytical Results. The results of the confirmatory surface soil sampling program indicate the presence of a group of SVOCs, polynuclear aromatic hydrocarbons (PAHs), total recoverable petroleum hydrocarbons (TRPH), and inorganics. PAHs and TRPH were detected in the grassy areas adjacent to the asphalt training area, in the vicinity of the training pit, grassy areas parallel to the old flightline and at the end of the old flightline. Inorganics were detected at one location south of the training area and in the grassy area adjacent to the northwest corner of the old flightline. The highest concentrations of PAH, TRPH, and inorganics were detected in the grassy area at the northwest corner of the old flightline.

One detection of lead, 178,000 milligrams per kilogram (mg/kg) at sample location CF7SS12 (Figure 2-4), was interpreted not to be representative of site conditions. Additional samples were collected adjacent to and beneath sample

location CF7SS12. Lead was detected in the additional samples at concentrations of 200 mg/kg or less, or three to five orders of magnitude less than the CF7SS12 sample concentration.

The distribution of surface soil contamination is shown on Figures 2-4, 2-5, and 2-6.

Subsurface Soil Analytical Results. VOCs, SVOCs, pesticides, and TRPH were detected in the confirmatory subsurface soil samples (Figure 2-7). Only TRPH concentrations were detected above guidance criterion.

Groundwater Analytical Results. A VOC (benzene), an SVOC (naphthalene), and inorganics were detected in the surficial aquifer groundwater. Benzene was detected in one sample from monitoring well CF7MW8S at a concentration of 13 micrograms per liter ($\mu\text{g}/\ell$). The State of Florida primary drinking water standard for benzene is $1 \mu\text{g}/\ell$. Monitoring well CF7MW8S is screened in the upper 15 feet of the surficial aquifer. Naphthalene was also detected in the sample from CF7MW8S at a concentration of $16 \mu\text{g}/\ell$. The FDEP naphthalene guidance criterion is $6.8 \mu\text{g}/\ell$. Organic contamination was not detected in the surficial aquifer at other sampling locations or at greater depths (Figure 2-8).

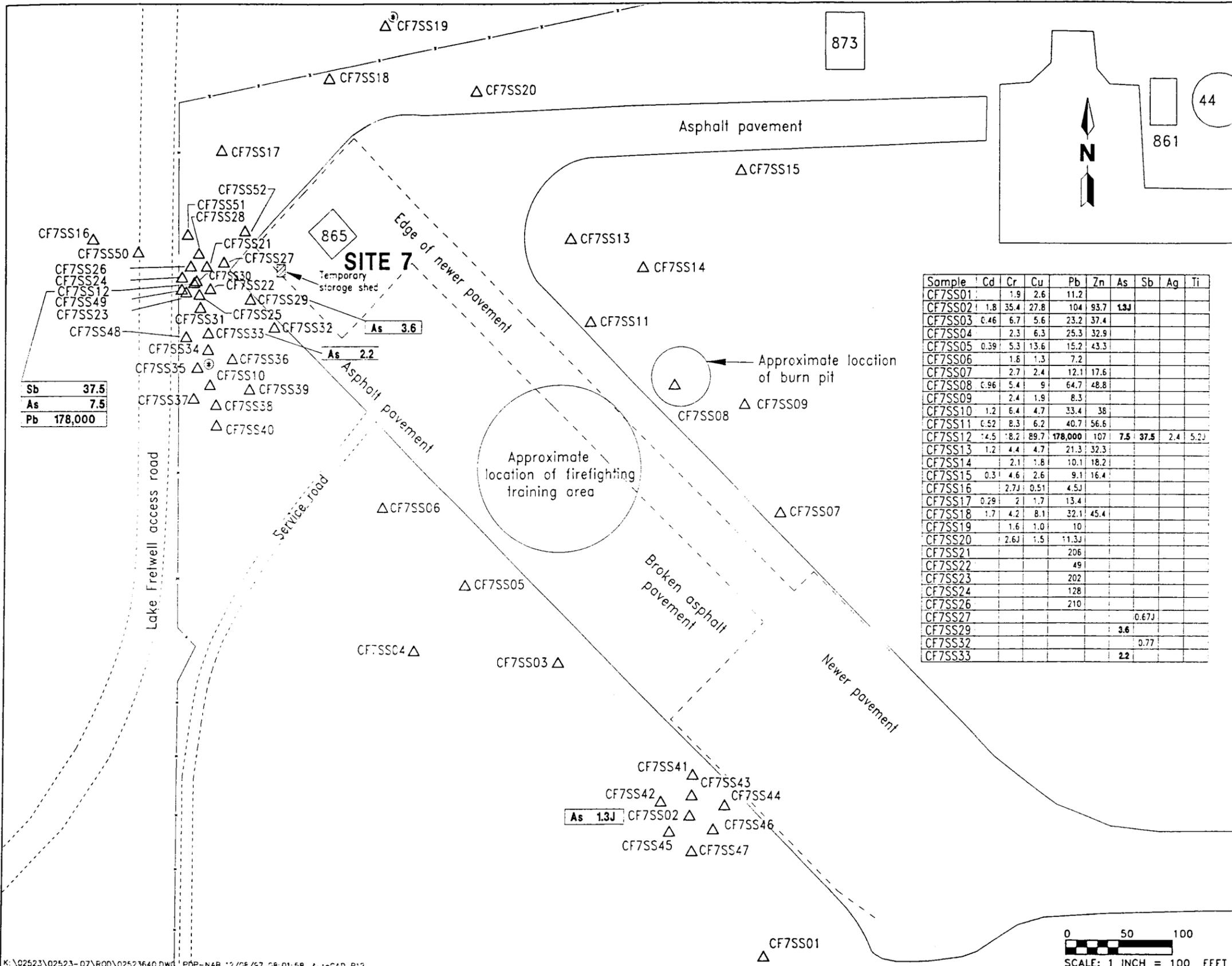
Inorganic concentrations above FDEP guidance criteria were detected in all Site 7 groundwater samples (Figure 2-9). Although FDEP secondary and/or groundwater guidance concentrations for aluminum, iron, manganese, and vanadium were exceeded, these detections were below the established NAS Cecil Field background values.

2.6 SUMMARY OF SITE RISKS. The BRA provides the basis for taking action and indicates the exposure pathways to be addressed by the RA. As a baseline it indicates what risks could exist if no action were taken at the site. Both human health and ecological risks were identified at Site 7.

Human health risks are estimated for both cancer and noncancer risks in accordance with the NCP. The NCP establishes "acceptable" as the excess lifetime cancer risk (ELCR), due to exposure to the human health chemicals of potential concern at a site by each complete exposure pathway, of 1 in 1,000,000 (1×10^{-6}) to 1 in 10,000 (1×10^{-4}) (USEPA, 1990) or a noncancer hazard index (HI) of equal to or less than 1. The State of Florida establishes an acceptable lifetime cancer risk as equal to or less than 1×10^{-6} and an HI equal to or less than 1.

Human Health Risk Assessment (HHRA). The purpose of the HHRA was to characterize risk associated with possible exposure to site-related contaminants for human receptors. Potential health risks were evaluated under current and assumed future land-use conditions for a subset of contaminants detected in surface soil, subsurface soil, and groundwater (surficial aquifer).

Surface Soil. The BRA indicates that PAHs, TRPH, antimony, and arsenic detected in surface soil located at the end of the old flightline pose human health risk. For the current land-use scenario, the ELCR associated with soil ingestion, dermal contact, and fugitive dust inhalation is 4×10^{-6} for aggregate (adult and adolescent) trespasser (Figure 2-10). Under future land-use scenarios the ELCR is 6×10^{-5} for an aggregate (adult and child) resident and 7×10^{-6} for an



LEGEND

- CF7SS15 Confirmatory surface soil sample location and designation
- △ Value indicates concentrations greater than Florida Department of Environmental Protection (FDEP) Soil Cleanup Goal.
- ⊕ Average of sample and duplicate
- ⊖ Fence
- J Estimated value
- + Value based on hexavalent chromium
- BSC Below background screening concentration
- ND Not detected
- NG No cleanup goal exists
- 865 Building or structure

| Sample | Cd | Cr | Cu | Pb | Zn | As | Sb | Ag | Ti |
|---------|------|------|------|---------|------|-------|------|-----|------|
| CF7SS01 | | 1.9 | 2.6 | 11.2 | | | | | |
| CF7SS02 | 1.8 | 35.4 | 27.8 | 104 | 93.7 | 1.3J | | | |
| CF7SS03 | 0.46 | 6.7 | 5.6 | 23.2 | 37.4 | | | | |
| CF7SS04 | | 2.3 | 6.3 | 25.3 | 32.9 | | | | |
| CF7SS05 | 0.39 | 5.3 | 13.6 | 15.2 | 43.3 | | | | |
| CF7SS06 | | 1.8 | 1.3 | 7.2 | | | | | |
| CF7SS07 | | 2.7 | 2.4 | 12.1 | 17.6 | | | | |
| CF7SS08 | 0.96 | 5.4 | 9 | 64.7 | 48.8 | | | | |
| CF7SS09 | | 2.4 | 1.9 | 8.3 | | | | | |
| CF7SS10 | 1.2 | 6.4 | 4.7 | 33.4 | 38 | | | | |
| CF7SS11 | 0.52 | 8.3 | 6.2 | 40.7 | 56.6 | | | | |
| CF7SS12 | 4.5 | 8.2 | 89.7 | 178,000 | 107 | 7.5 | 37.5 | 2.4 | 5.2J |
| CF7SS13 | 1.2 | 4.4 | 4.7 | 21.3 | 32.3 | | | | |
| CF7SS14 | | 2.1 | 1.8 | 10.1 | 18.2 | | | | |
| CF7SS15 | 0.3 | 4.6 | 2.6 | 9.1 | 16.4 | | | | |
| CF7SS16 | | 2.7J | 0.51 | 4.5J | | | | | |
| CF7SS17 | 0.29 | 2 | 1.7 | 13.4 | | | | | |
| CF7SS18 | 1.7 | 4.2 | 8.1 | 32.1 | 45.4 | | | | |
| CF7SS19 | | 1.6 | 1.0 | 10 | | | | | |
| CF7SS20 | | 2.6J | 1.5 | 11.3J | | | | | |
| CF7SS21 | | | | 206 | | | | | |
| CF7SS22 | | | | 49 | | | | | |
| CF7SS23 | | | | 202 | | | | | |
| CF7SS24 | | | | 128 | | | | | |
| CF7SS26 | | | | 210 | | | | | |
| CF7SS27 | | | | | | 0.67J | | | |
| CF7SS29 | | | | | | 3.6 | | | |
| CF7SS32 | | | | | | 0.77 | | | |
| CF7SS33 | | | | | | 2.2 | | | |

NOTES:
 All values reported in milligrams per kilogram.
 Samples CF7SS21 through CF7SS26 were analyzed for Pb only.
 Samples CF7SS27 through CF7SS40 were analyzed for As and Sb only.
 Samples CF7SS41 through CF7SS47 were analyzed for As only.
 Samples with no detections are not listed in the table.
 Sample interval, in feet below land surface, from which all samples were collected is 0-1 feet.

FDEP Selected Soil Cleanup Goals

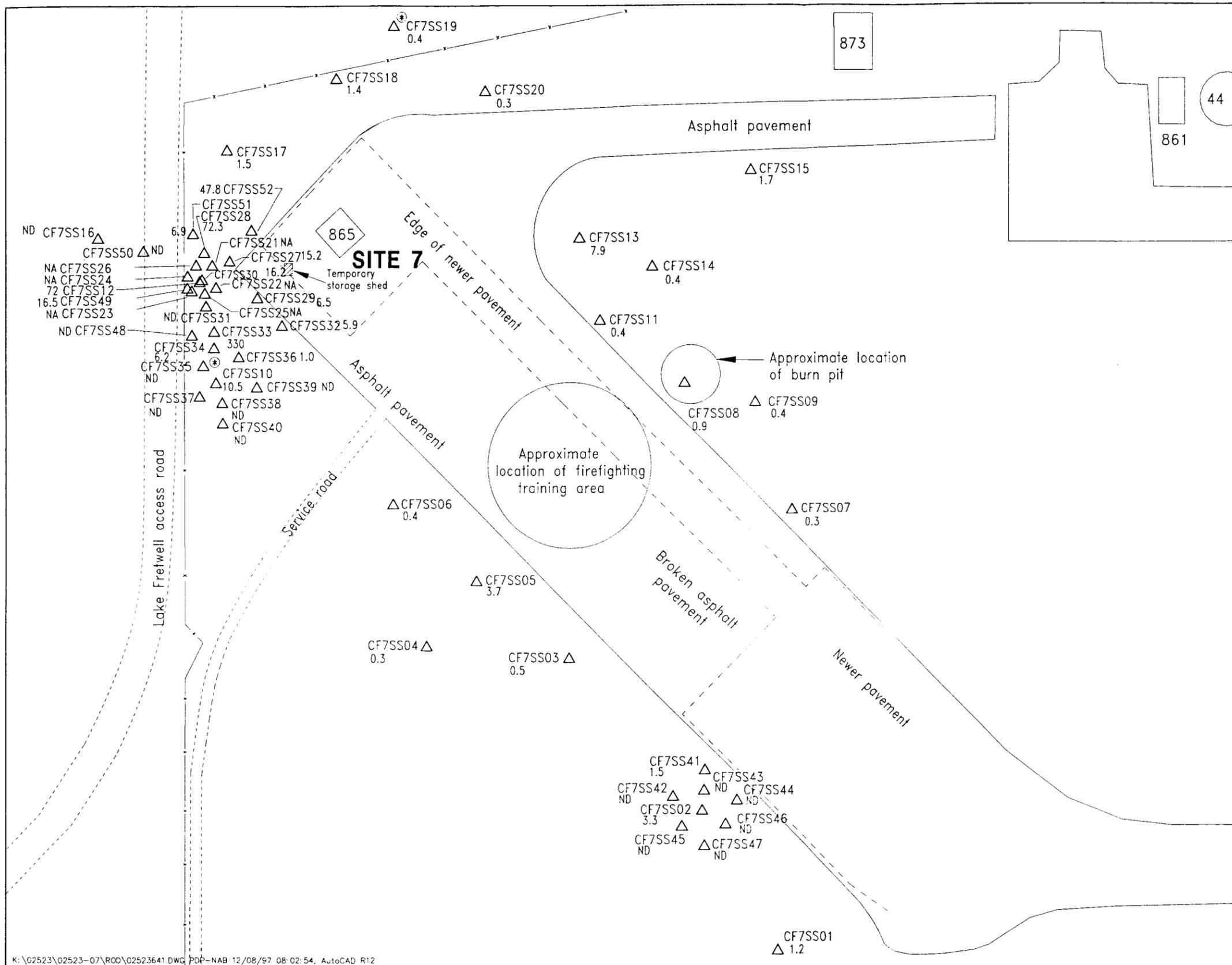
| | Residential | Industrial | Background screening value |
|--------------------------|-------------|------------|----------------------------|
| Sb Antimony | 26 | 220 | ND |
| As Arsenic | 0.7 | 3.1 | 3.4 |
| Ag Silver | 390 | 9,000 | ND |
| Cd Cadmium | 37 | 600 | ND |
| Cr Chromium ⁺ | 290 | 430 | 31.2 |
| Cu Copper | NG | NG | ND |
| Pb Lead | 500 | 1,000 | 15.6 |
| Tl Thallium | NG | NG | ND |
| Zn Zinc | 23,000 | 560,000 | 40.4 |

FIGURE 2-4
 DISTRIBUTION OF INORGANICS IN CONFIRMATORY SURFACE SOIL SAMPLES

RECORD OF DECISION
SITE 7, OPERABLE UNIT 3



NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA



LEGEND

- J Estimated value
- NA Not analyzed
- ND Not detected
- △ CF7SS07 Confirmatory surface soil sampling location (0 to 1 foot below land surface)
- ⊙ Average of sample and duplicate
- Fence
- 865 Building or structure

NOTES:
 All values are in milligrams per kilogram (mg/kg).
 Sample interval, in feet below land surface, from which all samples were collected is 0-1 feet.

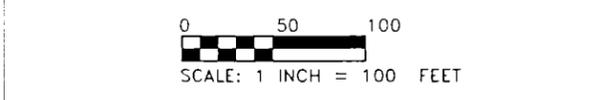
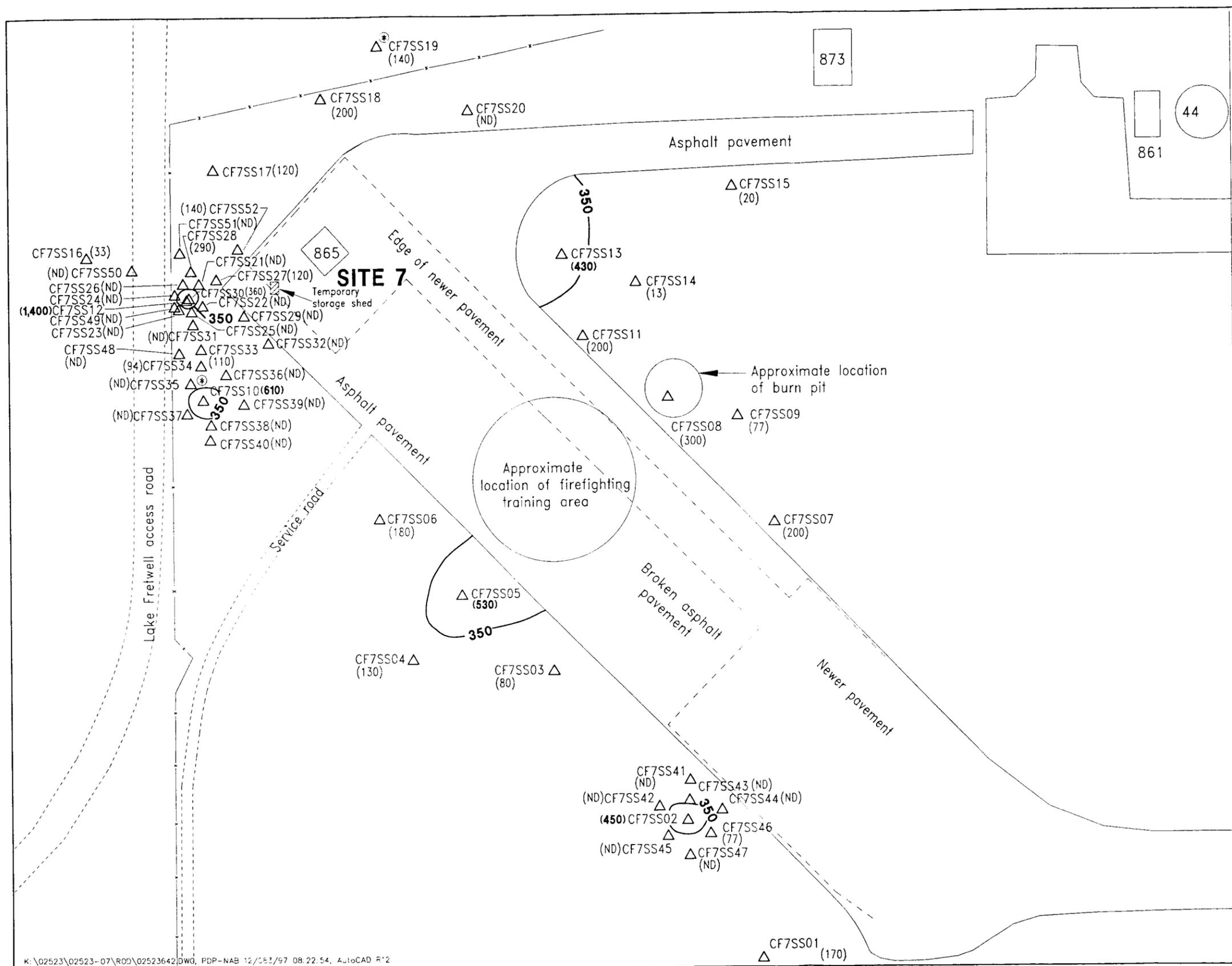


FIGURE 2-5
DISTRIBUTION OF TOTAL POLYNUCLEAR AROMATIC HYDROCARBON CONCENTRATIONS IN CONFIRMATORY SURFACE SOIL SAMPLES

RECORD OF DECISION
SITE 7, OPERABLE UNIT 3

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA



LEGEND

- △ CF7SS07 Confirmatory surface soil sample location and designation
- ⊕ Average of sample and duplicate
- +—+— Fence
- 865 Building or structure
- 350- 350 mg/kg concentration contour (dashed where inferred)

NOTES:
 All concentrations reported in milligrams per kilogram (mg/kg).
 Florida Department of Environmental Protection Soil Cleanup Goal is 350.
 Sample interval, in feet below land surface, from which all samples were collected is 0-1 feet.

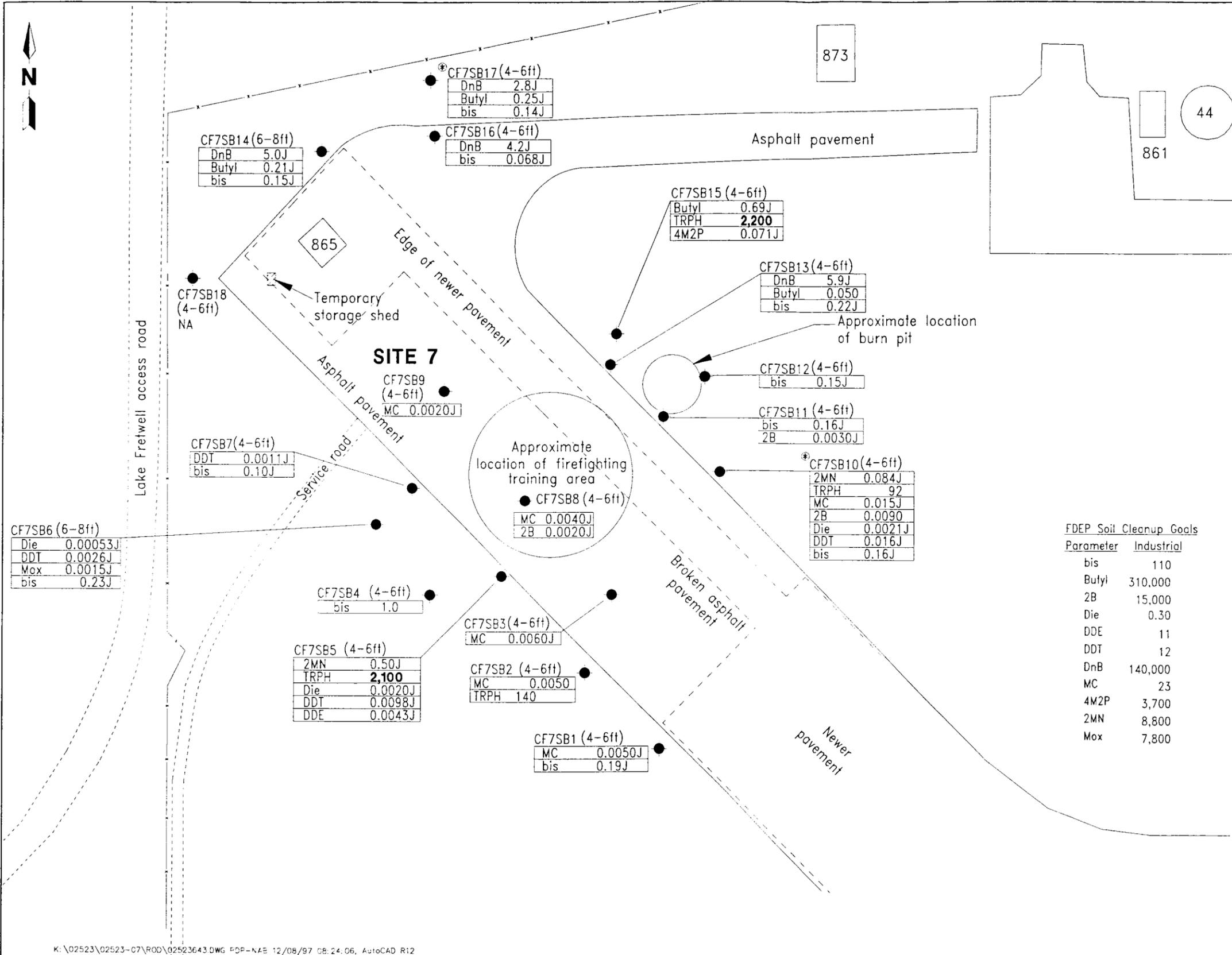
0 50 100
 SCALE: 1 INCH = 100 FEET

FIGURE 2-6
TOTAL RECOVERABLE PETROLEUM
HYDROCARBON CONCENTRATIONS IN
CONFIRMATORY SURFACE SOIL SAMPLES



RECORD OF DECISION
SITE 7, OPERABLE UNIT 3

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA



LEGEND

- 2B 2-butanone
- MC Methylene chloride
- 4M2P 4-methyl-2-pentanone
- SVOC Total semivolatle organic compounds
- 2MN 2-Methylnaphthalene
- TRPH Total recoverable petroleum hydrocarbons
- FDEP Florida Department of Environmental Protection
- Die Dieldrin
- DDE 4,4'-dichlorodiphenyltrichloroethene
- DDT 4,4'-dichlorodiphenyltrichloroethane
- Mox Methoxychlor
- DnB Di-n-butyl phthalate
- Buty Butylbenzyl phthalate
- bis bis(2-Ethylhexyl)phthalate
- J Estimated value
- ⊕ Average of sample and duplicate
- 865 Building or structure
- Fence
- 2,200** Value indicates concentrations equal to or greater than FDEP Soil Cleanup Goals
- CF7SB1 Confirmatory sample location
- NA Not applicable
- (4-6ft) Sample interval, in feet below land surface, from which sample was collected.

NOTE:
 All concentrations are in milligrams per kilogram.
 FDEP Proposed Soil Cleanup Value for TRPH is 350.

FDEP Soil Cleanup Goals

| Parameter | Industrial |
|-----------|------------|
| bis | 110 |
| Butyl | 310,000 |
| 2B | 15,000 |
| Die | 0.30 |
| DDE | 11 |
| DDT | 12 |
| DnB | 140,000 |
| MC | 23 |
| 4M2P | 3,700 |
| 2MN | 8,800 |
| Mox | 7,800 |

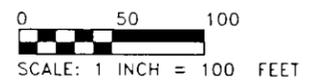
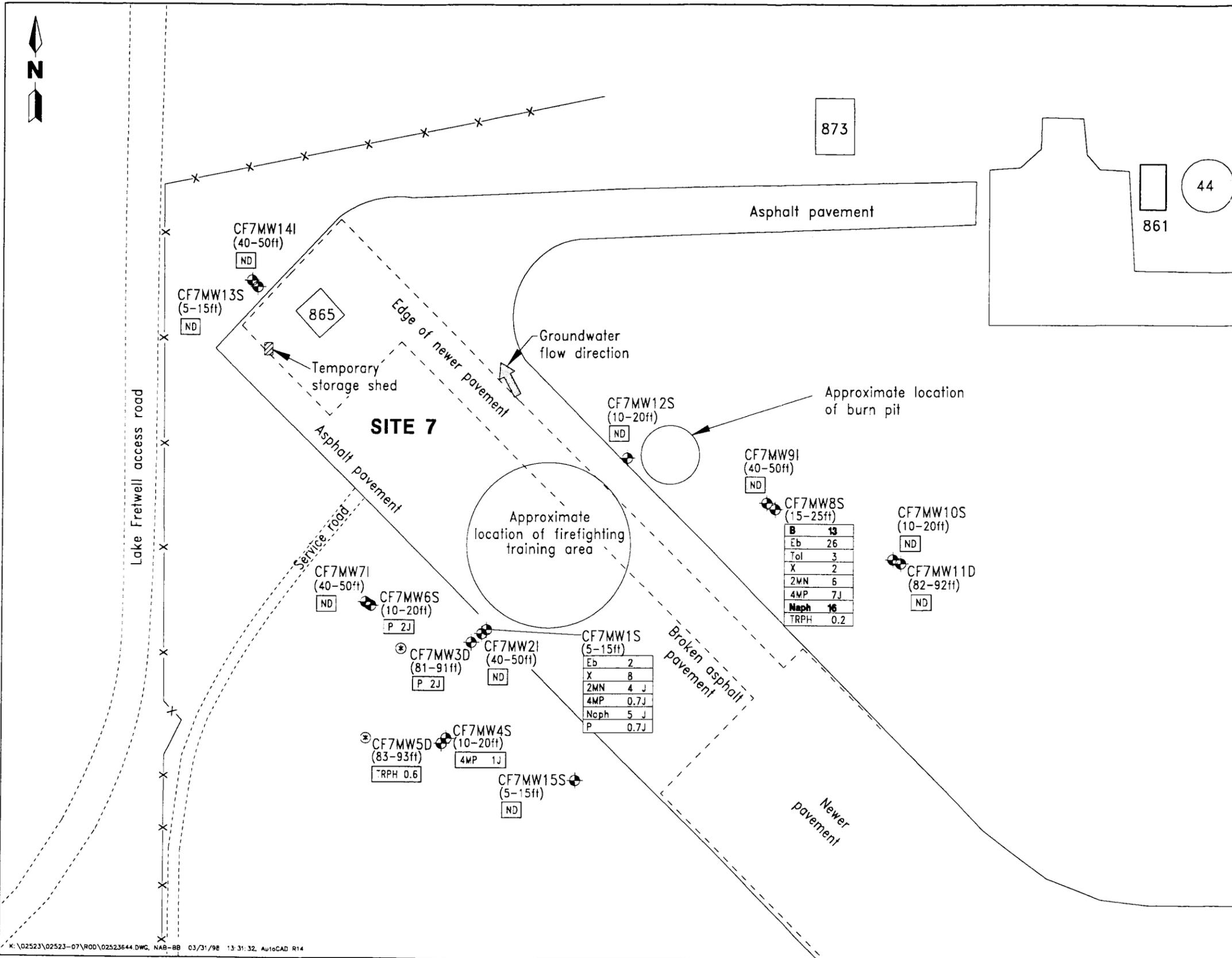


FIGURE 2-7
ORGANICS IN CONFIRMATORY SUBSURFACE SOIL SAMPLES

RECORD OF DECISION
SITE 7, OPERABLE UNIT 3

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA



LEGEND

- CF7MW12S Monitoring well location and designation
- (40-50ft) Monitoring well screen interval in feet below land surface
- 865 Building or structure
- X-X Fence
- ⊕ Average of sample and duplicate
- 13 Value indicates concentration greater than Florida Department of Environmental Protection groundwater guidance concentrations
- J Estimated value
- ND Not detected
- PD Primary drinking water standard
- SD Secondary drinking water standard
- G Guidance value
- TRPH Total recoverable petroleum hydrocarbons

NOTES:
All concentrations are in micrograms per liter except TRPH which is in milligrams per liter.

Florida Department of Environmental Protection
Groundwater Guidance Concentration

| Parameter | Regulatory value and type |
|-----------|---------------------------|
| B | Benzene 1 PD |
| Eb | Ethylbenzene 700/30 PD/SD |
| Tol | Toluene 1,000/40 PD/SD |
| X | Xylene 10,000/20 PD/SD |
| 2MN | 2-Methylnaphthalene 6.8 G |
| 4MP | 4-Methylphenol 35.0 G |
| Naph | Naphthalene 6.8 G |
| P | Phenol 10 G |

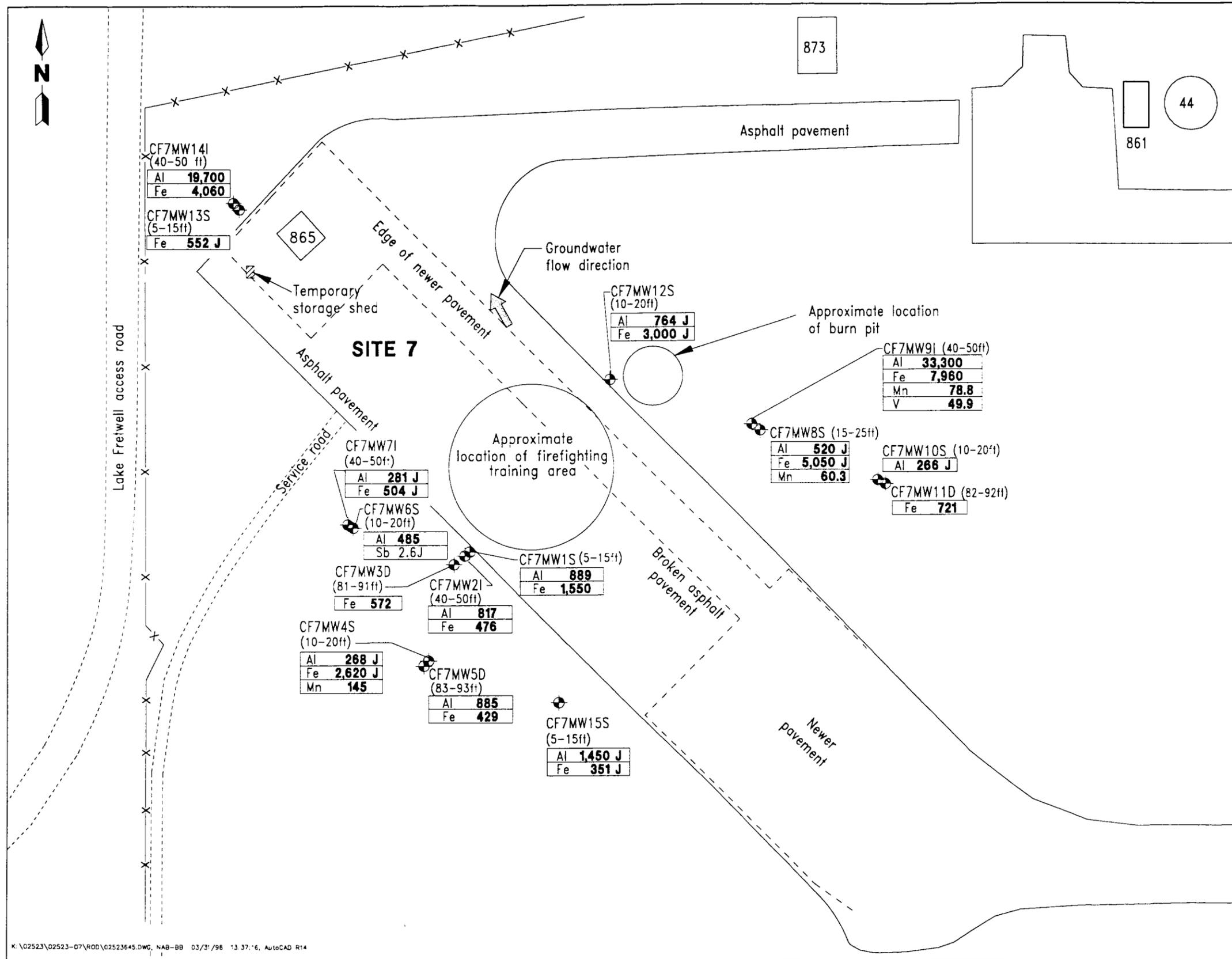
0 50 100
SCALE: 1 INCH = 100 FEET

**FIGURE 2-8
ORGANIC COMPOUND CONCENTRATIONS
IN CONFIRMATORY GROUNDWATER SAMPLES**

 **RECORD OF DECISION
SITE 7, OPERABLE UNIT 3**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

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LEGEND

CF7MW12S
 Monitoring well location and designation
 (40-50ft) Monitoring well screen interval in feet below land surface

873 Building or structure
 - Fence
 145 Value indicates concentration greater than Florida Department of Environmental Protection (FDEP) groundwater guidance concentrations
 J Estimated value
 PD Primary Drinking Water Standard
 SD Secondary Drinking Water Standard
 G Guidance Value

NOTES:
 All concentrations are in micrograms per liter.

FDEP Groundwater Guidance Concentration

| Parameter | Regulatory value and type |
|--------------|---------------------------|
| Al Aluminum | 200 SD |
| Fe Iron | 300 SD |
| Mn Manganese | 50 SD |
| V Vanadium | 49 G |
| Sb Antimony | 6 PD |

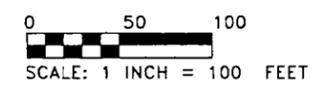
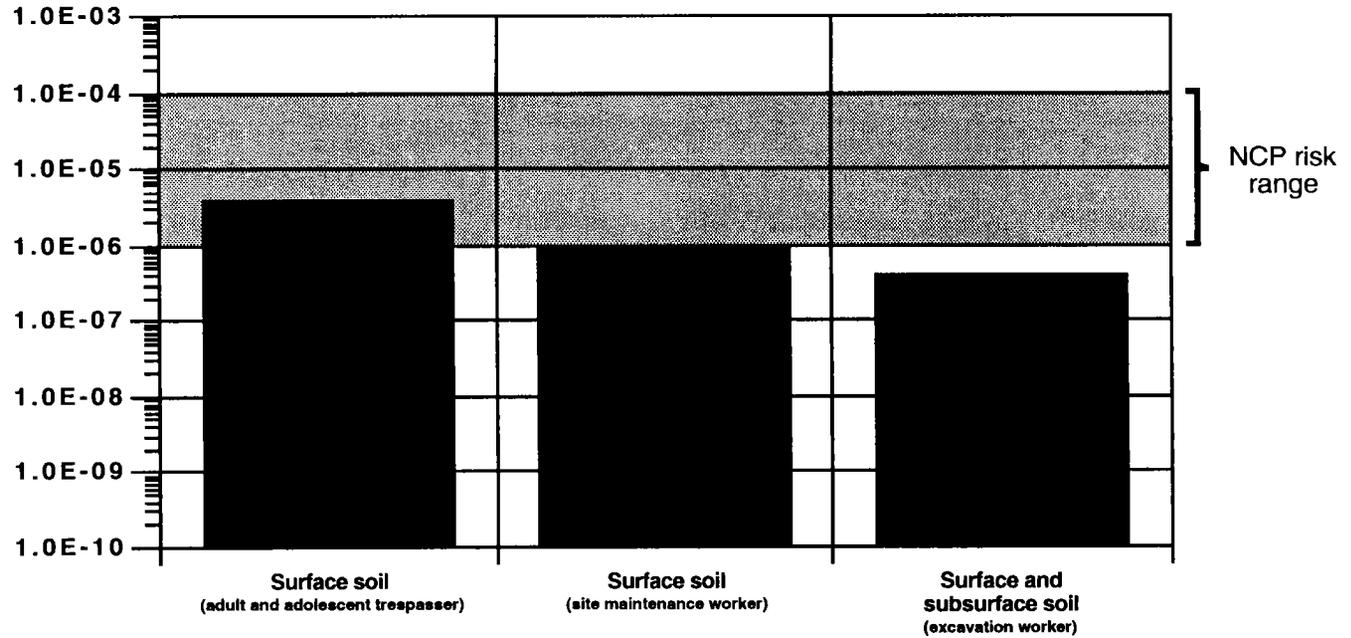


FIGURE 2-9
INORGANIC CONCENTRATIONS
IN CONFIRMATORY GROUNDWATER SAMPLES

RECORD OF DECISION
SITE 7, OPERABLE UNIT 3
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

**Excess Lifetime
Cancer Risk**



NOTES:

NCP = National Contingency Plan
1E-06 = 1 in 1,000,000
= 1×10^{-6}
= 0.000001

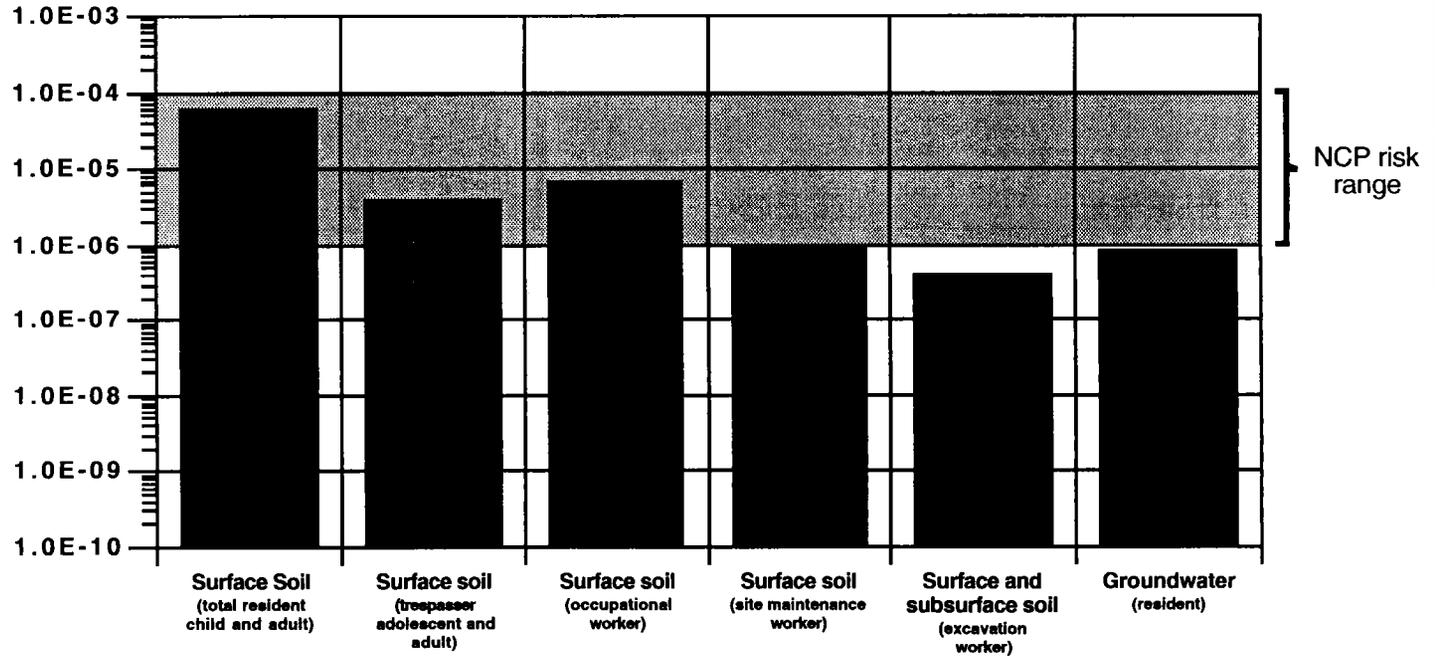
**FIGURE 2-10
EXCESS LIFETIME CANCER RISK SUMMARY,
CURRENT LAND USE**



**RECORD OF DECISION
SITE 7, OPERABLE UNIT 3**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

**Excess Lifetime
Cancer Risk**



NOTES:
NCP = National Contingency Plan

**FIGURE 2-11
EXCESS LIFETIME CANCER RISK SUMMARY,
FUTURE LAND USE**



**RECORD OF DECISION
SITE 7, OPERABLE UNIT 3**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

noncancer HI for a child resident is 2 (Figure 2-12), with antimony, TRPH, and arsenic contributing most of the risk.

Subsurface Soil. The BRA indicates that the compounds detected in subsurface soil do not pose an unacceptable risk to human receptors.

Groundwater. The BRA indicates that compounds in groundwater pose no current human health risks at Site 7. Under a future land-use scenario, a noncancer human health risk would be posed if the groundwater were used as a potable water supply. The HI for a resident child is 2 (Figure 2-12) and is posed by the presence of benzene, iron, aluminum, and antimony in groundwater.

Ecological Assessment. Ecological risk was assessed to exist for small mammals and terrestrial plants at Site 7 due to the presence of lead in surface soil. The risk is assessed to have a low probability of sublethal effects from ingestion or uptake of the lead. The risk is over estimated; however, due to the concentration of 178,000 mg/kg at sample location CF7SS12. Additional soil sample data adjacent to and beneath the CF7SS12 location indicate that the lead concentration is anomalous and not representative of site conditions.

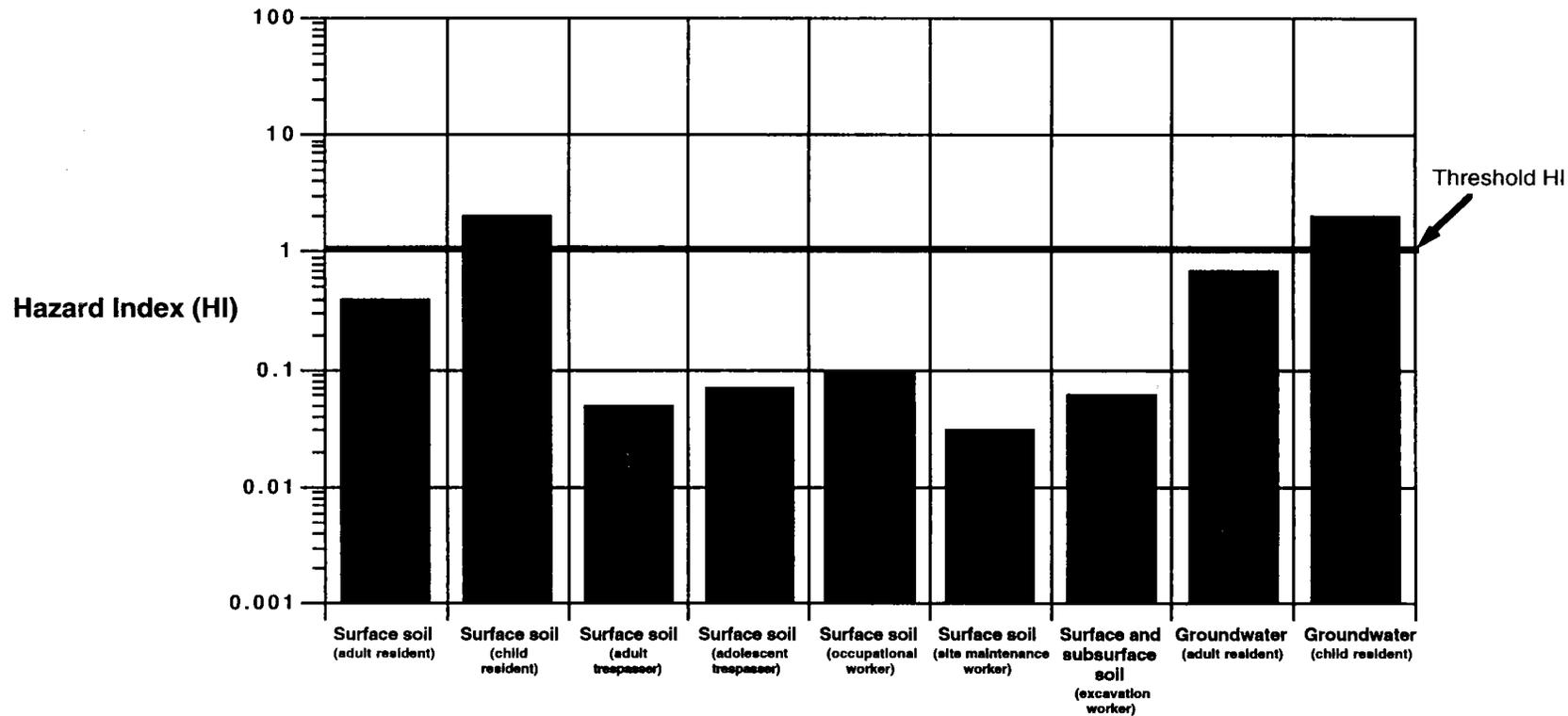
Ecological risk was not assessed for subsurface soil or groundwater contamination.

2.7 DESCRIPTION OF ALTERNATIVES. This section provides a narrative of each alternative evaluated. Alternatives were developed for surface soil and groundwater. No other media contain contaminants above risk-based levels. The FS for OU 3 (ABB-ES, 1997a) gives further information on the remedial alternatives.

2.7.1 Surface Soil Alternatives Two alternatives were developed and analyzed for Site 7 surface soil contamination. They include 7SS1, No Action, and 7SS2, Soil Excavation and Disposal.

7SS1, No Action. Evaluation of the No Action alternative is required by law and provides a baseline against which other alternatives can be compared. This alternative will involve leaving the site the way it exists today, relying on the organic contaminants to degrade naturally over time. Chemical-specific ARARs would not be met in the short term. Ecological and human health risks would not be immediately reduced. Contaminant toxicity, mobility, and volume would be reduced only over time. Because there is no action, alternative 7SS1 is easily implemented. There are no capital costs associated with 7SS1.

7SS2, Excavation and Disposal. This alternative involves removing approximately 790 yd³ of soil from the site and disposal of the excavated soil at an eligible landfill. Areas where surface soil will be excavated are shown on Figure 2-13. Clean soil will be placed in the excavated area, seeded, fertilized, and covered with hay or straw. Chemical-specific ARARs would be met and ecological and human health risk will be immediately reduced. Excavated soil will be contained and characterized as either hazardous or nonhazardous. If necessary, the soil will be treated to reduce toxicity before disposal. This alternative is relatively easy to implement, requiring a backhoe and transport equipment. Capital costs associated with this alternative vary from \$99,100 to \$609,900, depending upon characterization and disposal of the excavated soil.



**FIGURE 2-12
HAZARD INDEX SUMMARY, FUTURE LAND USE**



**RECORD OF DECISION
SITE 7, OPERABLE UNIT 3**

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

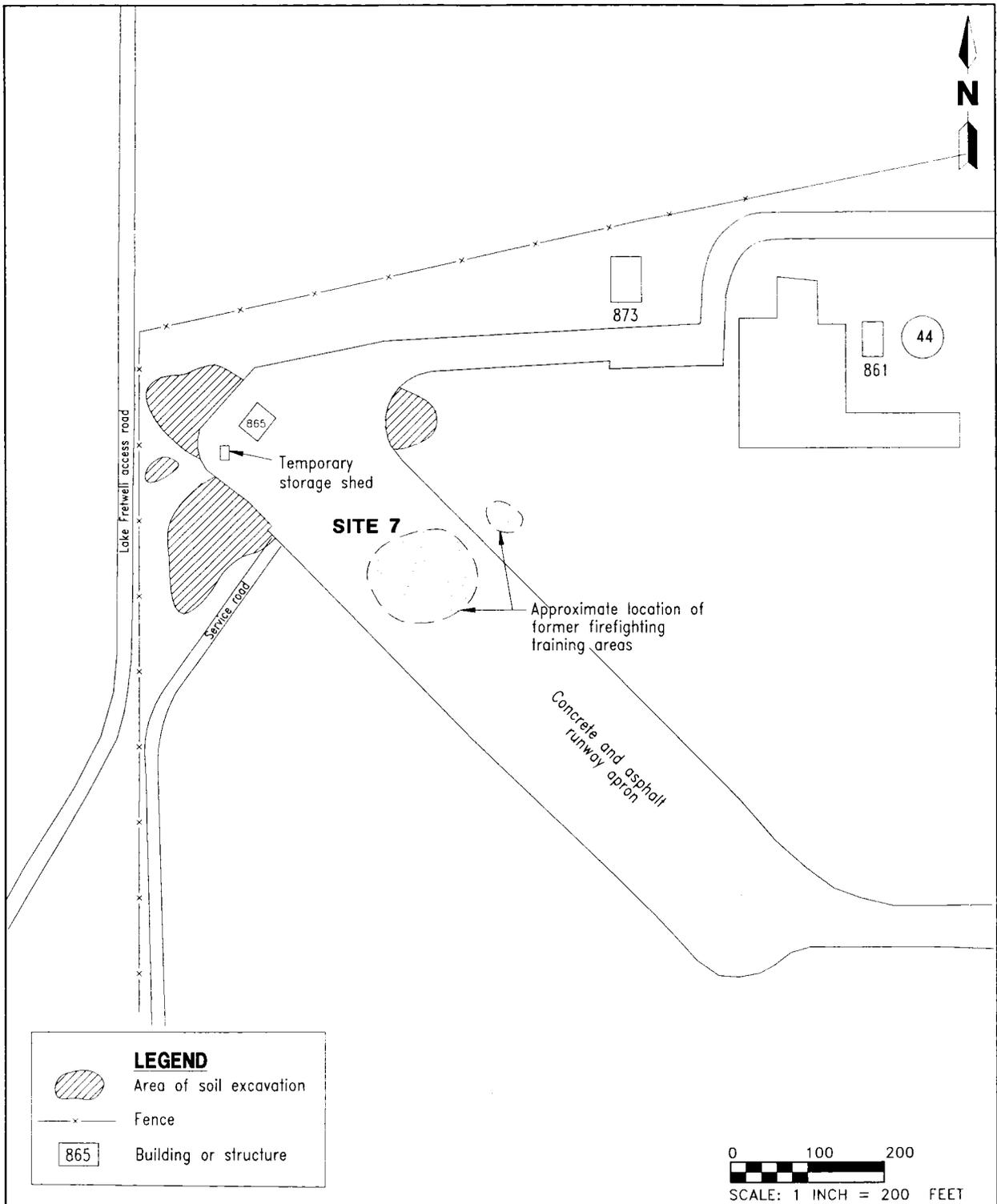


FIGURE 2-13
EXTENT OF SURFACE SOIL TO BE REMOVED



RECORD OF DECISION
SITE 7, OPERABLE UNIT 3

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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2.7.2 Groundwater Alternatives Two alternatives were analyzed for Site 7. They include 7GW1, No Action, and 7GW2, Annual Monitoring.

7GW1, No Action. Evaluation of the No Action alternative is required by law and provides a baseline against which other alternatives can be compared. This alternative will leave the site the way it exists today, relying on the organic contaminants to degrade naturally over time. Chemical-specific ARARs will not be met in the short term. Human health risk would be immediately reduced by restriction of groundwater use. Groundwater-use restrictions would be imposed by deed restrictions or land-use plans and property deeds. A formal request would be made to agencies administering the well installation permit program in Duval County to not issue permits for installation of drinking water wells that would pump water from the shallow aquifer. Contaminant toxicity, mobility, and volume could be reduced only over time, but the processes will not be monitored. The effectiveness and permanence of this alternative, therefore, will be unknown. Because there is no action, alternative 7SS1 is easily implemented. There are no capital costs associated with 7SS1.

7GW2, Annual Monitoring. This alternative will require monitoring of contaminant concentrations and degradation processes as well as restricting groundwater use. The final selection of wells for annual monitoring will be provided in the remedial design for Site 7. Human health risk will be immediately reduced by groundwater-use restrictions (as described in the No Action alternative 7GW1) and eventually by the degradation processes. Over time, the toxicity, mobility, and volume of the contaminants will be reduced. Site conditions will be reviewed to assess the progress of this RA. This alternative is relatively easy to implement, requiring sampling equipment and materials, laboratory analysis, and containment of purge water and waste materials. Capital costs associated with this alternative are \$137,000 over a 30-year period.

2.8 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES. This section evaluates and compares each of the alternatives with respect to the nine criteria outlined in Section 300.430(s) of the NCP (USEPA, 1990). These criteria are categorized as threshold, primary balancing, or modifying. Table 2-1 gives explanations of the evaluation criteria.

A detailed analysis was performed on the alternatives using the nine evaluation criteria in order to select a site remedy. The following is a summary of the comparison of each alternative's strength and weakness with respect to the nine criteria. Table 2-2 presents the evaluation of contaminated surface soil and groundwater remedial alternatives.

2.9 SELECTED REMEDIES. Two remedies were selected to address the contaminants in the surface soil and groundwater at Site 7. For surface soil, alternative 7SS2, Excavation and Disposal was selected. For groundwater, alternative 7GW2, Annual Monitoring, was selected.

2.9.1 Site 7 Surface Soil The selected alternative, Excavation and Disposal, requires the removal of contaminants of concern from the site. Excavated soil will be characterized and disposed of in either a subtitle D or C landfill, depending on soil characteristics. The excavated area will be backfilled and

revegetated. The estimated cost from this alternative is \$99,100 to \$609,900 and will take approximately 10 days to complete. This alternative was selected because it will immediately remove the contaminants of concern, reduce the toxicity, mobility, and volume of the contaminants, will have a long-term effect on the site, and is relatively easy to implement.

2.9.2 Site 7 Groundwater Much of the risk from groundwater is derived from a single detection of benzene. The selected alternative, annual monitoring, provides a method of observing the fate and any migration of benzene over time. Groundwater use from the surficial aquifer at Site 7 will be restricted, thereby providing immediate protection to human health. This alternative provides monitoring over 30 years, with 5-year reviews. During each review, site conditions will be reassessed and monitoring continued or other appropriate actions taken.

2.10 STATUTORY DETERMINATIONS. The remedial alternatives selected for Site 7 are consistent with CERCLA and the NCP. The selected remedy provides protection of human health and the environment, attains ARARs, and is cost effective. Table 2-3 lists and describe Federal and State requirements to which the selected remedy must comply. The selected remedy consists of permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies that reduces toxicity, mobility, or volume as a principal element. The selected remedy also provides flexibility to implement additional remedial measures, if necessary, to address RAOs or unforeseen issues.

2.11 DOCUMENTATION OF SIGNIFICANT CHANGES. The Proposed Plan for Site 7 was released for public comment in October 1997. The Proposed Plan contains the alternatives that were selected for soil and groundwater remediation: Alternative 7SS2, soil excavation and disposal, and alternative 7GW2, annual monitoring. No significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

**Table 2-1
Explanation of Evaluation Criteria**

Record of Decision
Site 7, Operable Unit 3
Naval Air Station Cecil Field
Jacksonville, Florida

| Criteria | Description |
|--------------------------|---|
| Threshold | <p>Overall Protection of Human Health and the Environment. This criterion evaluates the degree to which each alternative eliminates, reduces, or controls threats to human health and the environment through treatment, engineering methods, or institutional controls (e.g., access restrictions).</p> <p>Compliance with State and Federal Regulations. The alternatives are evaluated for compliance with environmental protection regulations determined to be applicable or relevant and appropriate to the site conditions.</p> |
| Primary Balancing | <p>Long-Term Effectiveness. The alternatives are evaluated based on their ability to maintain reliable protection of human health and the environment after implementation.</p> <p>Reduction of Contaminant Toxicity, Mobility, and Volume. Each alternative is evaluated based on how it reduces the harmful nature of the contaminants, their ability to move through the environment, and the amount of contamination.</p> <p>Short-Term Effectiveness. The risks that implementation of a particular remedy may pose to workers and nearby residents (e.g., whether or not contaminated dust will be produced during excavation), as well as the reduction in risks that results by controlling the contaminants, are assessed. The length of time needed to implement each alternative is also considered.</p> <p>Implementability. Both the technical feasibility and administrative ease (e.g., the amount of coordination with other government agencies needed) of a remedy, including availability of necessary goods and services, are assessed.</p> <p>Cost. The benefits of implementing a particular alternative are weighed against the cost of implementation.</p> |
| Modifying | <p>U.S. Environmental Protection Agency (USEPA) and Florida Department of Environmental Protection (FDEP) Acceptance. The final Feasibility Study and the Proposed Plan, which are placed in the Information Repository, represent a consensus by the Navy, USEPA, and FDEP.</p> <p>Community Acceptance. The Navy assesses community acceptance of the preferred alternative by giving the public an opportunity to comment on the remedy selection process and the preferred alternative and then responds to those comments.</p> |

**Table 2-2
Comparative Analyses of Remedial Alternatives for Site 7**

Record of Decision
Site 7, Operable Unit 3
Naval Air Station Cecil Field
Jacksonville, Florida

| Alternative | Threshold Criteria | | Primary Balancing Criteria | | | | |
|--|---|---|--|---|---|--|---|
| | Overall Protection to Human Health and Environment | Compliance with ARARs | Long-Term Effectiveness and Permanence | Reduction in Toxicity, Mobility, and Volume of Contaminants | Short-Term Effectiveness | Implementability | Cost |
| Soil, 7SS1, Surface Soil No Action | Protects by means of property deed restrictions. | Does not comply with the chemical-specific ARARs. | Not effective over the long term. | Natural transformation processes (physical, chemical, and biological) are anticipated to reduce the toxicity, mobility, and volume of contaminants. | Contaminated soil is left on site. Not effective over the short term. | Does not require any resources to implement "no action." | \$0 |
| Soil, 7SS2, Surface Soil Excavation and Off-Site Disposal | Provides overall protection to human health and the environment. | Complies with all ARARs. | Provides long-term effectiveness. | Reduces the toxicity, mobility, and volume of contaminants. | Provides short-term effectiveness. | Excavation and off-site disposal are implementable. | Residential land use, \$530,100 to \$5,422,900. Industrial land use, \$99,100 to \$609,900 |
| Groundwater, 7GW1, Groundwater - No Action | Could protect by means of property deed restrictions. | Does not comply with the chemical-specific ARARs. | May not be effective over the long term. | Natural transformation processes (physical, chemical, and biological) are anticipated to reduce the toxicity, mobility, and volume of contaminants. | Not effective over the short term. | Does not require any resources to implement "no action." | \$0 |
| Groundwater, 7GW2, Groundwater - Annual Monitoring | Groundwater restrictions will provide protection to human health. | Will, over time, comply with the chemical-specific ARARs. | May not be effective over the long term. | Limited purging during sampling episodes is anticipated to reduce toxicity, mobility, and volume of benzene. | Effective only through property deed restrictions. | Is readily implementable. | \$137,000 |

Note: ARAR = applicable or relevant and appropriate requirement.

**Table 2-3
Synopsis of Federal and State Regulatory Requirements**

Record of Decision
Site 7, Operable Unit 3
Naval Air Station Cecil Field
Jacksonville, Florida

| Name and Regulatory Citation | Description | Consideration in the Remedial Action Process | Type |
|--|---|--|--------------------------------------|
| Resource Conservation and Recovery Act (RCRA) Regulations, Identification and Listing of Hazardous Wastes (40 Code of Federal Regulations [CFR] Part 261) | Defines the listed and characteristic hazardous wastes subject to RCRA. Appendix II contains the Toxicity Characteristic Leaching Procedure. | These regulations would apply when determining whether or not waste onsite is hazardous, either by being listed or exhibiting a hazardous characteristic, as described in the regulations. | Chemical-specific Action-specific |
| Endangered Species Act Regulations (50 CFR Parts 81, 225, 402) | The Act requires Federal agencies to take action to avoid jeopardizing the continued existence of federally listed endangered or threatened species. | If a site investigation or remediation could potentially affect an endangered species, these regulations would apply. | Location-specific |
| Clean Water Act Regulations, Water Quality Standards (40 CFR Part 131) | Establishes ecological and health-based Federal Ambient Water Quality Criteria (AWQC) that are non-enforceable guidelines used by states to set their state-specific water standards for surface water. | These AWQCs may be used as a basis for determining cleanup levels in the absence of State water quality standards. | Chemical-specific |
| Historic Sites Act Regulations (36 CFR Part 62) | Requires Federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks. | Prior to remedial activities onsite, including remedial investigations, the existence of Natural Landmarks must be identified. | Location-specific |
| Safe Drinking Water Act Regulations, Maximum Contaminant Levels (MCLs) (40 CFR Part 141) | Establishes enforceable standards for potable water for specific contaminants that have been determined to adversely affect human health. | MCLs can be used as protective levels for groundwaters or surface waters that are current or potential drinking water sources. | Chemical-specific |
| Florida Hazardous Waste Rules (Florida Administrative Code [FAC], 62-730) | Adopts by reference sections of the Federal hazardous waste regulations and establishes minor additions to these regulations concerning the generation, storage, treatment, transportation, and disposal of hazardous wastes. | These regulations would apply if waste onsite is deemed hazardous and needs to be stored, transported, or disposed of. | Action-specific |
| Florida Surface Water Quality Standards (FAC, 62-302) | Rule distinguishes surface water into five classes based on designated uses and establishes ambient water quality standards (called Florida Water Quality Standards) for listed pollutants. | Because these standards are specifically tailored to Florida waters, they should be used to establish cleanup levels rather than the Federal AWQC. | Chemical-specific |
| See notes at end of table. | | | |

Table 2-3 (Continued)
Synopsis of Federal and State Regulatory Requirements

Record of Decision
Site 7, Operable Unit 3
Naval Air Station Cecil Field
Jacksonville, Florida

| Name and Regulatory Citation | Description | Consideration in the Remedial Action Process | Type |
|--|--|---|--------------------------------------|
| Florida Groundwater Classes, Standards and Exemptions (FAC, 62-520) | Rule designates the groundwaters of the State into five classes and establishes minimum "free from" criteria. Rule also specifies that Classes I & II must meet the primary and secondary drinking water standards listed in Chapter 62-550. | These regulations may be used to determine cleanup levels for groundwater that is a potential source of drinking water. | Chemical-specific |
| Florida Drinking Water Standards (FAC, 62-550) | Rule adopts Federal primary and secondary drinking water standards. | These regulations apply to remedial activities that involve discharges to potential sources of drinking water. | Chemical-specific |
| Petroleum-Contaminated Site Cleanup Criteria (FAC, 62-770) | Establishes a cleanup process to be followed at all petroleum-contaminated sites. Cleanup levels for the G-I and G-II groundwater are provided in the gasoline and kerosene/mixed product analytical groups. | Because groundwater at the site is Class II, these regulations would apply. | Chemical-specific Action-specific |
| Florida Groundwater Guidance, Bureau of Groundwater Protection, June 1994. | The document provides maximum concentration levels of contaminants for groundwater in the State of Florida. Groundwater with concentrations less than the listed values are considered "free from" contamination. | The values in this guidance should be considered when determining cleanup levels for groundwater. Although some values are not promulgated, Florida Department of Environmental Protection considers them applicable or relevant and appropriate requirements for setting cleanup criteria. | To be considered |
| Note: OU = Operable Unit. | | | |

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